UNIVERSITY OF TORONTO

FACULTY OF DENTISTRY

Brief to

THE ROYAL COMMISSION ON HEALTH SERVICES

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C O N T E N T S

Submission to

THE ROYAL COMMISSION ON HEALTH SERVICES

by

THE FACULTY OF DENTISTRY

UNIVERSITY OF TORONTO

INTRODUCTION

The substance of this report has been limited, as far as possible, to matters pertaining to dental education. The conclusions and recommendations reflect the main objectives of education in dentistry, namely, the reduction of the dental needs of the people and the provision of personnel to meet the demands for treatment and implementation of preventive programs.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

R.1 Need for Additional Educational Facilities.

(a) To maintain the present ratio of dentists to the population in Ontario through to 1980, it will be necessary to establish a new dental school in Ontario. (Para. 19)

(b) Planning and construction schedules should provide for the first graduating class of sixty students by 1968. (Para. 20)

(c) The capital cost of this project would be not less than $4,000,000.00. (Para. 21)

(d) These funds should be provided on a matching-grant basis, shared by the Provincial and Federal Governments.

R.2 Need for Training Additional Dental Teachers and Research Personnel:

(a) A long-range program for training full-time teaching and research personnel is urgently needed. (Paras. 22 - 30)

(b) Generous Fellowships are essential to encourage carefully screened applicants who have demonstrated aptitude for a full-time University career. (Paras. 31, 32)

(c) The Ontario needs in this respect would amount to $50,000.00 to $75,000.00 per year. (Paras. 34, 35)

(d) The national character of this project suggests that the major responsibility rests with the Federal Government. (Para. 37)

R.3 Need for Support for Faculty Clinic:

(a) It is recommended that Universities maintaining a dental school, should receive a grant from public funds to offset the cost of operating the extensive out patient clinic. (Para. 40)

(b) An annual grant of $1,000.00 for each student registered in the Faculty is necessary to maintain these clinical facilities for teaching dental students. (Para. 41)

(c) The municipalities in which these clinical facilities are located should share the costs of this community service with respective Provincial Governments.

R.4 Need for Student Aid:

(a) Promising students from low income families should be encouraged to seek dentistry as a career. (Paras. 42, 43)

(b) Many such students reside in the rural districts and small communities.

(c) It is recommended that bursaries and loan funds be provided so that more students in these categories who seek admission to the Faculty of Dentistry might be assured of substantial financial assistance, providing they maintain satisfactory standing each year. (Paras. 44, 45)

(d) Dominion-Provincial bursaries should be greatly increased. (Para. 48)

(e) Loan funds created by contributions from governments and the profession are required.

R.5 Need for Extending Public Education in Dental Health:

(a) Dental disease affects Canadians almost universally, and constitutes a major health problem. (Para. 56)

(b) Education is necessary to impress upon the individual his personal responsibility in the control of dental disease. (Para. 57)

(c) Financial backing is needed for a comprehensive dental health education program.

R.6 Need for Expansion of Dental Research:

(a) Research is vital to the future reduction of dental disease. (Para. 58)

(b) It is recommended that greatly increased funds be made available for training research personnel and for the support of projects. (Para. 59)

(c) It is estimated by 1975 the current expenditures for dental research in Canada must be increased twelve-fold to $3,000,000.00 per year. (Para. 60)

(d) The sources of research funds include government, industry and private individuals.

R.7 Need for More Dental Hygienists:

(a) The dental hygienist plays an increasingly useful role in the dental health team. (Para. 64)

(b) Dental hygienists are in very short supply, hence adequate training facilities should be part of all Canadian dental schools. (Paras. 65, 66)

(c) Financial assistance should be available for dental hygiene students. (Para. 67)

R.8 Need for Dental Assistant Training Course:

(a) The establishment of courses for dental assistants is essential to the overall dental manpower requirements. (Para. 68)

(b) It is recommended that courses for dental assistants be established in the science, technology and trades branch of the Secondary Schools of Ontario and of Vocational Schools. (Paras. 69, 70)

R.9 Need for Training Dental Students in the Use of Assistants:

(a) The productivity of the dental profession can be significantly increased by the more efficient utilization of the dental assistant. (Para. 71)

(b) Dental schools must study and experiment in the most effective procedures in teaching dental students to utilize the services of the dental assistant.

(c) It is estimated that $50,000.00 to $60,000.00 per year will be required for an experimental period of five years. (Para. 72)

R.10 Need to Study Extension of Duties of Auxiliary Personnel:

(a) No new types of auxiliary personnel should be introduced into the practice of dentistry until the profession has fully explored the effect of the maximum utilization of the services of the dental hygienist and the dental assistant. (Para. 74)

(b) Experimentation should be conducted in dental schools to develop ways and means of broadening (Para. 75)

the scope of service of the dental hygienist under the supervision of the dentist.

R.11 <u>Need for Closer Association Between Dental Schools and Teaching Hospitals</u>:

(a) A much closer association between the dental schools and the teaching hospitals would ultimately be reflected in improved health services for the people of Canada. (Paras. 76 - 79)

(b) The agency or agencies responsible for hospital administration and financing, are urged to recognize that dental services are an integral part of the provision of all health care services.

(c) Dental departments should be created in hospitals which do not already possess them, and in most instances dental departments which do exist need to be broadly expanded.

(d) In addition to teaching, out patient dental departments in hospitals could provide much needed services for people with marginal incomes.

(e) Dentists appointed to the professional staffs of such hospitals should be permitted to render their professional services under by-laws and regulations which give full cognizance to their education, training and licensure.

BODY OF BRIEF

Historical

1. In 1868, at the first session of the first legislature of the Province of Ontario, the Act Respecting Dentistry was passed, incorporating the members of the dental profession in the province, as the Royal College of Dental Surgeons of Ontario, with the dual function of teaching and licensing.

2. The School of Dentistry of the Royal College of Dental Surgeons was established in 1875.

3. In 1888 the College became affiliated with the University of Toronto, which established the degree of Doctor of Dental Surgery.

4. On July 1st, 1925, the School of Dentistry became the Faculty of Dentistry of the University of Toronto, with the Royal College of Dental Surgeons relinquishing to the University its function as a teaching body and retaining its functions as the licensing body for the Province of Ontario.

Dental Education - Development:

5. Since the beginning of this, the first dental school in Canada in 1875, the preliminary entrance requirements have progressed from a "High School Entrance Certificate" to one University year after senior matriculation or its equivalent, before commencing a four year professional course.

6. Initially, the academic course was short - with a long apprenticeship. Gradually, as the academic course was lengthened, the apprenticeship training was shortened and finally discontinued.

7. The liberal education preceding the four year dental program fulfils, in part, the cultural needs of the student pursuing a concentrated professional course, and provides basic knowledge and methods for succeeding scientific courses, and the attainment of a greater degree of maturity by the student. The four year requirement of professional education is accepted as the minimum time in which the student can absorb the ever-expanding volume of knowledge related to dental science.

Other Courses Offered at the University of Toronto, Faculty of Dentistry:

8. In addition to the course for dental students, the Royal College of Dental Surgeons established a one-year course for training dental nurses in 1919. This course functioned very successfully for forty years but was discontinued in 1959 because of insufficient applicants after the University entrance requirements were raised from a Secondary School Graduation Diploma to nine papers of Ontario Grade XIII, or its equivalent. Insufficient applicants applied for the course based on Grade XIII admission.

9. In 1951 the University of Toronto established a two-year course for dental hygienists, important members of the dental health team.

10. A series of postgraduate and graduate courses are offered at the Toronto school. These include courses of one, two and three years' duration beyond the dental degree (D.D.S.), designed to meet the need for specialists, research workers and teachers. (See Appendix "A")

Short refresher courses for general practitioners complete the program of continuing education.

Objectives of the Faculty of Dentistry.

11. The main objectives of the Faculty of Dentistry relate to education of undergraduate and graduate students and to research. The vitality of the teaching program is intimately linked with research activities, and conversely research gains in perspective from the didactic and clinical programs of the school. Simultaneously, the school must graduate full classes of dentists and auxiliary personnel imbued with the ideals of practicing preventive dentistry, and willing to do their utmost to meet the public's requirements for service.

Educational and Research Facilities:

12. In 1959 a modern new building, located in the vicinity of the teaching hospitals, was provided by the Provincial Government and the University of Toronto for dental education and research. The building was designed to accommodate four classes, each of 124 undergraduate dental students (totalling approximately 500 students); two classes, each of 50 dental hygienists; 30 to 40 graduate students, and an undetermined number of dentists attending refresher courses of short duration.

13. In planning the dental building, research and preventive dentistry received particular emphasis. The fourth and fifth floors are almost entirely devoted to research. Special consideration has

been given to subjects relating to the care of children, upon whom we must primarily focus our efforts for future control of oral diseases.

The Need for Dentists in Canada:

14. During the last two decades dental graduates from the school at Toronto have located in practice in all the provinces of Canada. Between 1940 and 1956, inclusive, 2,794 new dentists emerged from the five Canadian dental schools. Forty-six percent of these (1,296) graduated from the University of Toronto.

15. In 1962 there will be six Canadian schools graduating dentists. When these graduating classes are at maximum capacity, the Toronto school will supply Canada with approximately 40% of its new dentists.

16. The present ratio of dentists to the population is one to 3,200 based on the Gordon Royal Commission population estimates, and dental manpower age of sixty-nine years or under. Providing the existing dental schools in Canada maintain graduating classes at maximum capacity between 1965 and 1980, by 1980 the ratio will not change significantly.

17. Canada's population is spread across a vast area. The problems related to dental manpower shortage are most acute in the rural areas because of this scattered population. In Ontario, based on the number of licences issued to dentists and the population[1] in 1960, the overall ratio is one dentist to 2,471 people, but the unequal distribution shows up when we look at the ratio for some counties[2]:

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1. General Economics Branch, Ontario Government.

2. Proceedings - Royal College of Dental Surgeons of Ontario, 1960-1961, pp. 32-33.

Huron County	-	1 to 4,877
Lennox-Addington	-	1 to 5,672
Norfolk County	-	1 to 4,117
York County	-	1 to 1,622

The Need for Dentists in Ontario:

18. Table I shows the Ontario figures since 1920 and projected to 1980. The ratio declines from one to 1,901 in 1920 to a projection of one to 2,821 in 1980. The reason for these worsening ratios is a sharp upward change in the rate of population growth beginning in the 1945-1950 era, which is outstripping the planned increase (75 to 125)[3] in Ontario dentists to be graduated from the enlarged Toronto dental school facilities opened in 1959. (See Table I)

19. To maintain the 1960 Ontario ratio of one dentist to 2,471 people in the year 1980, an additional 500 graduates will be needed by 1980 over the number possible from the present facilities. To produce 500 new graduates for Ontario between 1968 and 1980 would require a new school with a capacity of fifty graduates per year. However, since all graduates do not necessarily remain in Ontario, the capacity of the graduating class should be set at approximately 60. (See Table II)

20. It would take two to three years to plan and build a new institution, and then four more years to graduate the first class. Hence, even if planning began now, in 1962, it would be 1968 before the first graduates would be available.

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3. Report of the Ontario Health Survey Committee: Vol. I, II, III, 1950, pp. 172-173.

21. The cost of such a project for capital outlay would be in the range of $4,000,000.00 to $5,000,000.00 on the basis of today's figures.

Need for More Teachers:

22. New dental schools established to increase the output of dental personnel, require new teachers. The number of potential new dental school teachers engaged in graduate training in preparation for a career in teaching falls far short of present requirements. The addition of new schools must be accompanied by an active program of recruitment and financial encouragement to potential new dental teachers.

23. The urgent need for new teachers is not limited to the requirements of future new dental schools. Replacements and additions for existing school staffs is a matter of concern to dental school administrators.

24. In the report[4] prepared by the American Council on Education on the Survey of Dentistry in the United States (1959-1960) frequent reference is made to "the heavy work loads that virtually all dental teachers carry". To substantiate this statement, the authors point out that the average number of full-time staff (or their equivalent in part-time) for each of the 47 United States' dental schools was 41 for an average total undergraduate enrolment of 288 dental students. This represents the equivalent of one full-time academic staff member for seven students, but it must be recognized that each of these

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4. Survey of Dentistry Final Report: American Council on Education, Washington, D.C., 1961, p.299.

teachers is engaged in administration, graduate instruction, and research as well as teaching undergraduate students. A more satisfactory ratio would be one full-time staff member (or his equivalent in part-time) to six students.

25. In 1961-1962, the staff of the Faculty of Dentistry, University of Toronto comprised the equivalent of 45[5] full-time members instructing a total enrolment of 430 undergraduate dental students. This is a ratio of one staff member to 9.5 students. To equal the one to seven ratio existing in the United States' schools, which has been described as inadequate, sixteen new full-time teachers should be added immediately to bring the total for Toronto to sixty-one.

26. Projecting the Toronto figures to provide for the anticipated 1963-1964 enrolment of 480 undergraduate dental students, a total of sixty-eight full-time teachers (or their equivalent) will be required. This represents an increase of twenty-three teachers over the 1961-1962 establishment.

Ratio of Full-time to Part-time Teachers:

27. The United States' Survey of Dentistry report recommends "employing a large proportion of teachers on a full-time basis"[6]. It adds further "A survey of the forty-seven dental deans revealed that, in their opinions, the composition of the ideal faculty would be 63.4% full-time teachers, and 36.6% part-time."

28. The present Toronto Faculty ratio is: 35.6% full-time and 64.4% part-time, which is almost the reverse

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5. 16 full-time; 6 half-time; 108 part-time

6. Survey of Dentistry Final Report: American Council on Education, Washington, D.C., 1961, pp. 309-310.

of that considered to be the ideal by the forty-seven dental educators in the United States.

29. If the additional sixteen full-time equivalents referred to in paragraph 26 above, were, in fact, sixteen full-time teachers, the ratio for the Toronto Faculty would be 51.6% full-time and 48.4% part-time.

30. Projecting the figures for an enrolment of 480 students in 1963-1964 as quoted in paragraph 27 above, and adding twenty-three full-time teachers, the ratio would be 57.3% full-time teachers and 42.7% part-time. These figures still fall short of the United States' ideal, but approach the objective of a 60:40 ratio, long considered the optimum ratio by the administration of the Toronto Faculty.

Recruitment and Preparation of Full-time Teachers:

31. There is abundant evidence available that dental personnel will not seek teaching as a full-time career unless opportunities for preparation and employment are more attractive. A few highly desirable dedicated people can be attracted to teaching and research, but not in the numbers required, both now and for the future. A major effort in recruitment and provision of adequate financial assistance while undergoing training is required.

32. Subsequent salaries should be commensurate with the additional qualifications and comparable to the financial returns made possible by the application of similar qualifications in private practice. A career in teaching and research is not something

that can be assumed, without considerable preparation, by even the most competent clinician.

33. The majority of our future full-time teaching personnel, must be provided financial support while undertaking one to two years of graduate study and research training, and a prospect of a stimulating and rewarding future.

34. Based on National Research Council figures[7] - the average Fellowship stipend awarded by the Associate Committee on Dental Research was $4,500.00 per annum. A two-year program, allowing for adjustment during the second year, and other incidentals, should be set at $10,000.00. Increasing tuition fees and other basic costs may result in the need to revise these Fellowships accordingly.

35. To prepare for an addition of twenty-three new full-time staff members as outlined in paragraph 27, and two replacements a year for the present staff categories over a five-year period, 1962-1967, thirty-three full-time staff members should be prepared. The total cost for this project would be $330,000.00 spread over the five-year period as follows:

Year 1962-1963 - $36,000.00 (eight first year Fellowships)

Year 1963-1964 - $80,000.00 (eight first year and second year Fellowships)

Year 1964-1965 - $80,000.00 (eight first year and second year Fellowships)

Year 1965-1966 - $80,000.00 (eight first year and second year Fellowships)

Year 1966-1967 - $54,000.00 (eight second year Fellowships)

36. The new staff referred to in paragraph 35 provides for the specific foreseeable needs of the Faculty of Dentistry, University of Toronto. New dental schools and other existing schools will have similar needs, commensurate with local circumstances.

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7. Proceedings of the Twenty-seventh Meeting of the Associate Committee on Dental Research, 1961, p.14.

37. New staff will gravitate to the most attractive opportunities, and their preparation must be considered a matter of national importance in the total dental health needs of the nation. Financial assistance should, therefore, be derived from Federal sources.

Cost of Dental Education to the University

38. In the Survey of Dentistry in the United States[8] the cost to the University in educating a dental student was shown to be approximately $3,000.00 per student per year, and it is estimated that by 1970 it will be $5,000.00. The average tuition fee in the United States' dental schools was $750.00 per year in 1959-1960.

39. Using comparable base lines to those used in the United States' Survey, it is estimated that the cost to the University of Toronto to educate a dental student is less than $2,000.00 per student per year. If additional full-time staff were added as outlined in paragraph 27 above, the cost per student would still be less than $3,000.00 per student per year.

40. Dental education is an expensive discipline in the University, because the University provides and maintains an extensive public out patient clinic in which students receive clinical instruction. This clinic makes a significant contribution to the community in terms of public dental health services, and should be supported generously by agencies concerned with the welfare of the people. It is logical that the clinical facilities in the large teaching hospitals are available for use by the University for training medical students at a nominal cost to the University.

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8. Survey of Dentistry Final Report. American Council on Education, Washington, D.C. 1961. p.373

41. It is therefore recommended that Universities maintaining a dental school should receive a grant from public funds, for the support of a public dental teaching clinic. A basic grant of $1,000.00 per student per year is the minimum required to maintain clinical facilities for teaching dental students.

Cost of Education to the Dental Student

42. The United States' Survey of Dentistry suggests[9] that "the applicants with the best qualifications to study dentistry tend to come from families whose incomes are modest when compared to those families of the entire group".

43. On the other hand approximately 80% of the dental students in Ontario are supported by parents whose annual income is in excess of the average provincial wage.[10] It would appear that family income is an important factor determining application to dental schools and that many do not apply for lack of funds. (See Table III)

44. The 1960-61 Canadian Dental Students' Register[11] indicates that the average cost of tuition, instruments, textbooks, supplies and incidentals, is $900.00 per year or $3,600.00 for the four year course. Room and Board adds $2,600.00 on the average but this varies with the locality. The total cost of the four year course averages $6,200.00. (See Appendix "B")

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9. Survey of Dentistry Final Report. American Council on Education, Washington, D.C. 1961. p.285

10. The average weekly wage and salary in Ontario is approximately $80.00 or $4,160.00 per year. Department of Economics, Ontario Government, 1960.

11. Dental Students' Register: prepared by the Bureau of Economic Research, Canadian Dental Association, Dental Students' Register: J.C.D.A., pp. 167-176, March 1961.

45. The dental student's overall financial burden is greater than that of most other University students, because of the necessity to purchase instruments, the approximate cost of which, spread over the four year course, is $1,000.00. This additional expenditure is a serious disadvantage when trying to recruit good students to dentistry from the modest income families, (paras. 42 and 43).

46. The Toronto school has reduced the four year outlay for instruments to approximately $500.00. This was accomplished when the University purchased dental instruments for rental to the students. The maintenance of this system contributes to the cost of operating the clinical facilities referred to in paragraphs 40 and 41.

47. The financial burden to the dental student remains a matter of lively concern when recruiting applicants for a career in dentistry. The manpower of the nation will be more effectively utilized when financial aid is made available to permit capable students of low income parents to receive higher education. Scholarships have been established for first class honour students. Greatly increased bursary assistance would allow other good students of low income parents who fail to qualify for scholarships, to obtain a University education.

48. It is recommended, therefore, that bursaries be provided so that promising, capable students, who would otherwise be denied University education, might be assured of tuition fees, books, instruments, supplies and incidental expenses, throughout their course, providing they maintain good standing.

Subsidization of Education - Aid to Placement:

49. In return for substantial assistance given through bursary aid, some program of service after graduation could be required. This might be part-time service in a hospital dental department, school clinic, public health unit, or other similar agency.

50. There is a comprehensive government-supported scheme already in existence, which is influential in the recruitment of dental personnel for the Royal Canadian Dental Corps. Full-time service in the Dental Corps for a limited number of years after graduation fulfils the dentist's obligation pursuant to the assistance given.

51. The establishment of a similar comprehensive educational assistance scheme to provide dental personnel for areas where the manpower shortage is most acute (see paragraph 17) should be given serious consideration. Such service, as in the case of the Dental Corps, would be for a specified period of time.

52. It is anticipated that a program such as that contemplated in the preceding paragraph would have a most desirable influence on recruitment. In a study of 355 (See Table IV) students currently enrolled in the University of Toronto, Faculty of Dentistry, it was found that 63% came from cities with a population greater than 100,000; 18% from municipalities between 10,000 and 100,000, and 19% from communities under 10,000 population. However, in Ontario about half the population lives in communities under 10,000, hence many of the potential candidates for dentistry are living in rural areas or small communities.

53. It has also been established from statistics related to the Toronto school, that graduates tend to return to

communities similar in size to their home communities. With 81% of the applicants coming from the large metropolitan areas and the larger municipalities, the scarcity of dentists in smaller communities seems likely to be perpetuated, unless an effort is made to obtain a greater proportion of applicants from these smaller communities. A subsidized educational program may benefit the areas in need.

Ways of Reducing Future Dental Manpower Needs:

54. It is almost impossible now to make projections of the number of dentists required in the future because there is a wide gap between the need for dental care and the lesser demand for dental service. The need may be reduced by:

(a) Dental health education.

(b) Research leading to development of preventive measures.

55. The increasing demands for treatment can be more nearly met by practice procedures which include better integration of auxiliary personnel into the dental health team.

The Effect of Dental Health Education:

56. Dental and oral diseases are probably the most prevalent complex of afflictions suffered by man today. The tragedy in respect to treatment alone is that such treatment does not confer immunity to further disease, nor reduce the backlog of need for treatment.

57. Dental and oral diseases can be dramatically reduced through the application of knowledge already available.

The Welland County Health Unit Study[12] proved the effectiveness of health education. The public must be persuaded to adopt these proven measures, and to that end the efforts of the dental profession and of public health agencies must be redoubled toward more positive dental health education. The dental schools must give leadership by educating personnel capable of making dental health education a dynamic force in the reduction of need for treatment services. Coincidentally, public health agencies must be given the financial backing necessary to mount a comprehensive dental health education program.

Research and Preventive Measures: (See Appendix "C")

58. Research is an important item in any program aimed at improving the health status of people. Our knowledge relating to normal growth, development and metabolism of oral structures is a product of research, as are all the methods of preventing and treating diseases. Research provides the major impetus for vigorous professional growth and for the ultimate reduction in the dental health needs of a population.

59. The most important recommendation affecting an increase in research potential is to increase the number of personnel trained and interested in basic and clinical research relating to dentistry. Fellowships to support the training of personnel are urgently needed as the first stage. As more trained personnel become available, financial support for research will have to be increased from Federal and private sources.

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12. Grainger, R.M. and Sellers, A.H. "The Welland and District Dental Health Program". J.C.D.A. Vol. 43: pp. 415-425, October, 1952.

60. Current funds[13] for dental research in Canada amount to approximately $250,000.00 per year. Maximum use of existing research facilities and the development of new ones during the next ten to fifteen years will require greatly increased funds for training of personnel and support of active projects. It is estimated that by 1975 financial support for dental research must be in the order of $3,000,000.00 per year.

Auxiliary Personnel:

61. In several surveys conducted by the dental profession in the United States and more recently, the United States' Survey of Dentistry, it has been established that one dentist with the assistance of two auxiliaries can increase his productivity by two-thirds when compared with the dentist working alone. The integration of auxiliaries into the dental service team becomes an important phase of the dentist's education. Dental schools are just beginning to recognize their full responsibility in this connection.

62. Full utilization of auxiliary personnel in the dentists' offices could provide the equivalent in terms of productivity of many additional dentists, produced at greatly increased cost. The essential purpose of the utilization of auxiliary personnel in the practice of dentistry is to permit the profession to render more good dental care to more people.

The Dental Hygienist:

63. The primary function of the dental hygienist is to assist the dentist in providing oral health care. She applies

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13. Proceedings - Associate Committee, Dental Research, National Research Council, 1961.

her knowledge and skill either in the office of the private practitioner or in health education activities in schools and other agencies. The dental hygienist is formally trained to provide preventive and educational services.

64. The dental hygienist plays an increasingly useful role in the dental health team. Because of this team relationship with the dentist, she must receive her training in a dental school, so that both the new dental graduate and the hygienist may develop their conjoint services more efficiently. This arrangement is vital if more good dental care is to be provided for more people.

65. Dental hygienists have been educated in Canada since 1951. Three of the six Canadian schools now offer a two-year course for this type of auxiliary. The demand, by the profession, for auxiliaries capable of rendering time-consuming preventive services in the dental office is increasing noticeably. Their role in current and future dental manpower requirements in Canada must be emphasized.

66. Provision should be made so that all the Canadian dental schools might offer a two-year course for dental hygienists. Such action is essential if, firstly, there are to be sufficient personnel of this type to assist in vital preventive services, and secondly, each new dental graduate is to appreciate fully the team concept of dental practice.

67. Financial assistance to Universities offering dental hygiene courses and to students capable of successfully completing the course, but who may not be able to apply because of financial limitations, should be

available in the expectation that such action will increase the supply of hygienists.

The Dental Assistant:

68. The function of the dental assistant is to aid the dentist by performing those services not limited by law to dentists or dental hygienists. While no formal training for dental assistants exists in Canada today, there is great need for vocational training programs for this type of personnel. Dental assistants currently receive "on the job" training in the dental office, which is time-consuming and sometimes inefficient in terms of dental office productivity.

69. Training programs for dental assistants could conceivably be established in Secondary School vocational training departments. A combination of general education, commercial courses and dental assisting extended over a three-year period and culminating in a Secondary School Graduation Diploma, has merit. Field training in a dental office during the final year of the course would provide a valuable practical experience.

70. The establishment of courses for dental assistants is vital to the overall dental manpower requirements. The organization of training facilities for dental assistants in some Secondary Schools should be encouraged through public health grants. The benefits which would accrue in terms of public health personnel are directly related to the provision of more health service for more people in Canada.

71. The productivity of the dental profession can be significantly increased by the more efficient utilization of the dental assistant. The dental school recognizes this fact,

and must provide the opportunity for the dental student in his final year to receive instruction and experience in the utilization of the services of the dental assistant. To initiate this team approach, integrating the efforts of the dentist-dental assistant, pilot studies must be introduced in the dental schools. The utilization of public health training grants is justified in developing such a project.

72. It is estimated that for a final year class of 120 dental students, a training grant of $60,000.00 per year would be required for a period of five years in order to develop the most efficient approach to the team concept. A minimum of four weeks per student with a trained dental assistant would yield results in increased dental manpower service, which would be most significant in the total Canadian dental health care scheme.

73. It is recommended that pilot studies of this nature be established and promoted with the enthusiasm and vigor they deserve in terms of dental care for the Canadian people.

New Types of Auxiliary Personnel:

74. From time to time suggestions are made that a new type of auxiliary be introduced into the practice of dentistry. From the paragraphs immediately preceding, it will be ascertained that great opportunities exist for increasing the service rendered by the dental profession by better integration and utilization of the existing auxiliaries, namely, the dental hygienist and the dental assistant. Such possibilities should be developed to the limit before the profession or the public embark in another direction.

75. This does not preclude the promotion of experimentation in the dental school. Expansion of the duties generally recognized as being indigenous to the dental hygienist, to permit a broader scope of service under the continuing responsible supervision of the dental profession, is to be encouraged.

Dental Service - In a Teaching Hospital:

76. The modern hospital aims to render the most efficient care of the sick and to train personnel to render this service. The inclusion of dentistry and its integration with other health specialties is, therefore, necessary in order to provide a comprehensive health service. Dentistry has a responsibility to co-operate in the care of medical and surgical patients in whom dental disease is a predisposing, causative, aggravating or complicating factor. Co-operation by the medical profession is also needed in the management of dental disease when systemic disorders complicate the treatment.

77. The education of a dental student can be regarded as consisting of both technical and biological components. Technical training refers to instruction in procedures which can be satisfactorily taught in a dental school and clinic environment especially designed for the purpose. Biological training includes those subjects affecting diagnosis and treatment planning with due regard to the patient's physical condition. An essential part of the dental student's professional training should be attendance in the dental department of a University-teaching hospital.

78. A much closer association between the dental school and the teaching hospitals would be of benefit both to medicine

and dentistry. Medical students would have an opportunity to better appreciate the relation between dental disease and general health problems, and the dental student would see more of the diseases with oral manifestations, such as systemic infection, nutritional disturbances and others.

79. The agency or agencies responsible for hospital administration and financial support are urged to recognize the need for enlarging the function of dental services in both teaching and non-teaching hospitals. Such a step is essential in providing total health services for the people of Canada.

TABLE I

PAST AND PROJECTED RATIO OF DENTAL LICENTIATES PER POPULATION OF ONTARIO

Year	Population in thousands	Dental Licentiates	Population per Dentist
1920	2893	1522	1901
1925	3111	1755	1773
1930	3386	1800	1881
1935	3575	1890	1891
1940	3747	1900	1972
1945	4000	2088	1916
1950	4471	2010	2224
1955	5266	2325	2265
1960	6089	2464	2471
1966	6990*	2677+	2611
1971	7898*	2961+	2667
1976	8973*	3276+	2739
1980	9800*	3474+	2821

* Population projection from General Economics Branch, Ontario Government, 1962 (based on D.B.S. Figures.)

\+ Dental Licentiate estimates from Research Division, Faculty of Dentistry, University of Toronto, 1962.

TABLE II

CHANGES AND PROJECTED CHANGES IN DENTAL LICENTIATE REGISTER

Year	No. of licenses issued by April of stated year	Changes in Register During Remainder of Fiscal Year							Overall change in year stated	Summary of Register Change		
		Additions				Deletions						
		New U.of T. Graduates Class size	No. staying in Ontario	N.D.E.B. or special exams	Re-licenses	Leave Ontario	Retire or un-known cause	Deceased		Percent of new U. of T Grads staying in Ont.	Crude Morta-lity Rate	Net change from NDEB Special exams Relicenses Leaving Ont. Retirements
1951	2119	153	133	6	7	?	38	30	+78	85.9	.014	-25
1952	2197	85	78	11	18	?	21	23	+63	91.7	.010	+ 8
1953	2261	75	63	9	10	?	32	23	+27	84.0	.010	-13
1954	2288	70	62	12	12	?	24	25	+37	88.5	.011	0
1955	2325	79	70	16	10	10	51	33	+ 2	88.6	.014	-35
1956	2327	78	71	11	12	5	17	27	+45	91.0	.012	+ 1
1957	2372	78	67	17	16	16	32	46	+ 6	85.9	.019	-15
1958	2378	76	67	16	14	16	23	34	+24	88.2	.014	- 9
1959	2402	80	75	17	2	13	22	33	+26	93.7	.014	-16
1960	2428	94	84	21	20	7	58	34	+36	89.4	.014	-24
										Means of ten previous rates of change used in estimates		
1961	2464	72	(63.8)					(32.5)	(+18.5)	88.69	.0132	(-12.8) below
1962	2483	85	(75.4)					Crude		(88.69)		(-12.8)
1963	2512.8#	(114)*	(101.1)					survival		(88.69)		(-12.8)
1964	2567.9#	(109)*	(96.7)					rate		(88.69)		(-12.8)
1965	2617.9#	(125)	(110.8)					.9868		(88.69)		(-12.8)
1966	2676.9#	(125)	(110.8)							(88.69)		(-12.8)
1971	2960.6#	(125)	(110.8)							(88.69)		(-12.8)
1976	3276.3#	(125)	(110.8)							(88.69)		(-12.8)
1980	3473.8#	(125)	(110.8)							(88.69)		(-12.8)

Source: Research Division, Faculty of Dentistry.

( ) Based on past ten years no. of grads. remaining, and capacity of school.

* Class size based on present undergraduate enrolment.

\# Estimated future No. of licentiates = .9868 (no. in previous year)-12.8

TABLE III

APPROXIMATE ANNUAL INCOME OF PARENTS OF STUDENTS IN ATTENDANCE AT FACULTY OF DENTISTRY, UNIVERSITY OF TORONTO IN YEAR 1962

Income in Dollars	No.	%	Accumulated	
Under 4,000.	62	18.3	99.9	18.3
4,000. - 6,000.	100	29.6	81.6	47.9
6,000. - 8,000.	57	16.9	52.0	64.8
8,000. - 10,000.	50	14.8	35.1	79.6
10,000. - 15,000.	38	11.2	20.3	90.8
15,000. - 20,000.	17	5.0	9.1	95.8
Over 20,000.	14	4.1	4.1	99.9

Source: Research Division, Faculty of Dentistry, University of Toronto.

TABLE IV

Students attending Faculty of Dentistry, University of Toronto in year 1962, classified according to size of home town lived in prior to entering University.

Community Size	Students	
	No.	%
Under 10,000	67	18.9
10,000 to 100,000	63	17.7
Over 100,000	225	63.4
Total	335	100.0

Source: Research Division, Faculty of Dentistry.

Submission to

THE ROYAL COMMISSION ON HEALTH SERVICES

by

THE FACULTY OF DENTISTRY

UNIVERSITY OF TORONTO

Appendix "A"

CONTINUING EDUCATION

Knowledge pertaining to the science and art of dentistry continues to accumulate as research goes on in the biological, clinical and technical sciences. Practicing dentists are obliged to keep informed of this new knowledge through various means available to them. The Dental Faculty of the University of Toronto plays a very important role in providing a variety of means for dentists in Ontario. In addition to this, the Faculty also provides advanced two and three-year programs in the various clinical aspects of dentistry recognized as specialties in Ontario. And finally, in an attempt to at least partially satisfy the demand for research workers and teachers, the Faculty also offers research programs leading to graduate degrees.

Leadership for all these aspects of continuing dental education in Canada has emanated from this Faculty, and the impact of this program has been felt, not only locally, but from coast to coast in Canada and in other parts of the world as well.

The specific services and programs offered through the Faculty are outlined in more detail below:

1. Library Service:

The Faculty library provides a loan service, at no charge, to all dentists in the Province of Ontario and all Faculty alumni in Canada. This service involves approximately 2,000 entries per year to satisfy the demand of dental practitioners for books and periodicals to help keep themselves abreast of current advances through reading.

2. Extramural Lectures and Dental Seminars:

Members of the Faculty staff deliver some thirty to thirty-five extramural lectures each academic session to the various dental societies in the Province of Ontario. The cost of this service is borne by the Royal College of Dental Surgeons of Ontario and the University. In addition, during the last five or six years special dental seminars have been arranged whereby two staff members travel to some of the more outlying districts in the province to present a two-day seminar in some aspect of dentistry. Six seminars have been presented each year since they were begun. The costs involved have been borne partly through National Public Health Grants administered through the province, partly by the Dental Public Health Committee of the Ontario Dental Association, and partly by those attending the seminars.

Both these activities have been very popular judging from the attendance figures. They have provided an excellent way for dentists to be brought up-to-date in clinical and other aspects of dentistry, at minimum cost, and with a maximum of convenience.

3. Short Postgraduate Courses:

For many years the Faculty has offered a series of short courses in biological and clinical aspects of dentistry, ranging in length from two days to one week. These are concentrated courses designed to cover a broad area of knowledge in minimum time. Since they are presented in the dental school, the dentist must leave his practice to attend these courses, and while the University fee has been kept to a minimum and is considerably less than comparable fees in American Universities, nevertheless, the total expense for such courses for Canadian dentists is relatively high both because of the necessity for continuing office overhead while on the course, and because fees and expenses are not deductible for income tax purposes.

Including the advance registration for this session, since the fall of 1959 a total of 193 dentists will have attended these courses, most from the Province of Ontario, but twelve from other areas in Canada and thirty-eight from the United States as well.

4. Specialist Courses:

Four postgraduate Diploma Courses leading to specialist certification in the fields of Dental Oral Surgery and Anaesthesia, Paedodontics, Periodontics, and Orthodontics are presented in the Faculty. The course in Surgery extends full-time over a three-year period; the others are two years in length. The basic purpose of these programs is to provide graduate dentists with the additional skills and knowledge to qualify as specialists in one of the four fields recognized as specialties of dentistry in the Province of Ontario. While emphasis is placed on advanced clinical experience and study of the related basic sciences, research methodology and techniques are also taught. Dentists are also trained in the special area of public health dentistry in a one-year postgraduate program in the Faculty. In this instance a particularly close liaison exists with the division of the University training medical public health officers.

For many years these were the only specialist certification courses offered in Canada, and this Faculty has thus played a very important role in providing specialists for other areas of Canada as well as for Ontario. Over the past five years thirty-seven candidates have been trained as specialists, of which twenty were from Ontario, eleven from the remainder of Canada, and six from outside Canada.

In addition to these formal Diploma Courses leading to specialist certification, other more informal programs in basic or clinical science may be arranged for special students. Such programs pro-

vide dentists with opportunities for advanced study in any one of the many biological or clinical areas of dentistry, but they do not lead to qualification as a specialist.

5. Research Training:

In order to train new teachers and research workers the Faculty offers graduate training programs leading to the Master's or Ph.D. degree through the School of Graduate Studies of the University. These programs provide candidates with an opportunity for experience and training in research with a view to combining this with teaching in a career. The major fields of study include Oral Biology, Oral Pathology, and Preventive Dentistry, and a number of minor courses are offered for graduate credit, not only for dental graduates, but for other graduate students in the University as well.

Submission to

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Appendix "B"

STUDENT FINANCIAL AID

A majority of dental students at the University of Toronto pay their own way through the course, being supported by their families and/or their own earnings and savings. Approximately one-third of them request, and the majority of these receive, some financial assistance.

In Session 1960-1961, financial aid came from the following sources:

Loans, from the Ontario Student Aid Fund	$35,000.00	
Loans, from University, Alumni and other Funds	8,000.00	
TOTAL LOANS:		$43,000.00
Bursaries, Dominion Provincial Fund	$11,000.00	
Bursaries, from University, Alumni and other Funds	12,000.00	
TOTAL BURSARIES:		$23,000.00
Scholarships and prizes - awarded in Course		5,000.00
		$71,000.00

This total is equivalent to an average of nearly $400.00 per recipient or $130.00 per enrolled student.

In the future student requests for financial aid are likely to increase, and our figures so far this year confirm this. The increase may be due in part to the fact that the availability of some aid is becoming widely known. But in the main, the increase is due to greater need. Dental students, like other undergraduates, are drawn from an ever-widening sector of

society with a consequent increase in money problems. Business conditions may curtail parental assistance, and in this connection it should be noted that a recession strong enough to reduce summer employment opportunities, immediately and sharply increase the students' needs, for they rely heavily on such earnings.

If any increase in aid is possible, the loan field should be considered last. The supply of money there is adequate under present conditions, and the repayment of loans adds to the burden of the young practitioner who must also pay for the expensive equipment needed in dentistry. Scholarships, on the other hand, are probably overdue for an increase in value to keep pace with rising costs, and could also be increased in number even if this means a slight lowering of standards. It is important that gifted children - not just the exceptionally brilliant - be given every help in furthering their education. Bursary funds, too, should be increased for much more help is needed for the average young man who by definition forms the bulk of the student body and subsequently the main body of the dental profession. There is not enough money available to give him the help he needs.

Submission to

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UNIVERSITY OF TORONTO

Appendix "C"

RESEARCH

Introduction:

The major activities of the Faculty of Dentistry relate to undergraduate and graduate education and research. The vitality of the teaching program is intimately linked with research activities, and conversely, research gains in perspective from the didactic and clinical programs of the school.

Research is an important item in any program aimed at improving the health status of people. Our knowledge relating to normal growth, development and metabolism of oral structures is a product of research, as are all the methods of preventing and treating diseases. Research provides the major insurance for vigorous professional growth and for the ultimate reduction in the dental health needs of a population. Since some of the major problems associated with research in dental schools may be brought out in referring to the development of research in this Faculty, it may be worthwhile to briefly trace its history.

Research Prior to 1950:

Before 1950, research was not considered a major activity in this Faculty. Shortage of well-trained staff and finances were the main reasons for the limited research program. However, a sincere effort was made to emphasize prevention in the teaching and practice of dentistry. During this time, there developed an increasing awareness that the long-range solution to the problems of dental health must be through research and prevention.

Campaign for Funds:

One of the first actions of the Division was to embark in 1953, on a fund-raising campaign which was to reach industry, private individuals and above all, the members of the profession in Ontario and the alumni of this school wherever they were.

The campaign netted a total of over $250,000.00, of which $138,000.00 was contributed by dentists, and $120,000.00 by industry. These funds, along with those from the University and grant sources, were used to build several laboratories and animal quarters, to support technical help, and to administer the Division.

New Facilities, 1959:

A most significant recent development has been the completion and occupation of the new research quarters. These quarters are built along five main areas: Histopathology, histochemistry, bacteriology, biochemistry, biometrics and nuclear biology. The acquisition of urgently needed equipment for radioactive isotope work, chromatography, microradiography, and epidemiological studies will permit a broader scope for research.

Present Research Program:

Dental health problems which are of major public health significance are dental caries, periodontal disease, and malocclusions. The present research program at the Division is related to these areas and consists of basic investigations into the composition, metabolism and structure of oral tissues. A partial list of projects will indicate the scope of the investigations:

1. A ten-year, serial study of dento-facial growth and development at Burlington. The main objective of this project is to study the incidence, etiology, and interception of malocclusions in children.
2. Histochemical studies of the gingiva and periodontal tissues.

3. The organic constituents of enamel.
4. The effect of topical stannous fluoride as a caries preventive agent.
5. The effect of tooth morphology on caries activity.
6. Nutrition, tooth form and caries susceptibility.
7. Relation between carbonate and fluoride in enamel.
8. Strontium^{90} content of primary teeth.
9. Formation of osteoblasts, odontoblasts and osteoclasts using tritium labelled thymidine.
10. Bacteriology of infected root canals.
11. Dental aspects of metabolic diseases in children.
12. Electrophoretic studies of the proteins in saliva.

Funds for Research:

The total annual budget for the Division of Dental Research is approximately $70,000.00. This money is used for such items as equipment, animals, supplies, and salaries for technical personnel, but does not include salaries for academic personnel. The major sources of funds are the Federal Government, through the National Research Council and the National Health Grants (sixty percent), the Canadian Dental Association (two percent), the Division of Dental Research and the University (thirty percent), and the United States Public Health Service (eight percent). While it is anticipated that these will continue to be major sources of funds in the future, some changes in the accepted pattern of support are needed. More assistance from private sources is desirable and should be forth coming. Direct aid should be available to the University so that this institution may support more scientific research and graduate programs. While there is no immediate shortage of funds for equipment, supplies, and technical personnel, there is a serious shortage of financial assistance for the training and subsequent support of academic staff.

There are, at present, few staff members who may devote the major portion (sixty percent or over) of their time to research. Assistance along these lines in the form of institutional grants and research professorships would be most welcome. Also of great importance are summer undergraduate studentships which permit undergraduates to undertake research during summer months. This program has been of great value in stimulating the student interest in research and graduate studies.

Increasing Research Potential in Dentistry:

In a presentation such as this, some projection into the future is mandatory, albeit the risk of gazing into a crystal ball. Since dental research in terms of money spent, and in terms of recruitment and favorable environment, has lagged in proportion to its importance, the rate of growth in this area in the next decade will obviously have to be greater than in the past. The fostering of more research in dental schools, in public health areas, and in hospitals is imperative if we are to expect improved services and above all, better methods of prevention. How may this be accomplished?

Singly, the most important recommendation in increasing research potential is to increase the number of personnel trained and interested in basic and clinical research relating to dentistry. So important is this item that in a recent survey of dentistry in the United States, the Commission stated that it believes the research potential of existing schools must be expanded before new schools are built, and that recruitment for dental research is even more important than recruitment for dental practice.

A summary of the major recommendations which are related to increasing the research potential of schools of dentistry are as follows:

1. More full-time research and teaching personnel are necessary.
2. As more trained personnel become available, financial support for research will have to be increased from Federal sources and private individuals.
3. Some changes in the accepted pattern of support for research would seem to be desirable. The University should be in a position to support more scientific research and more graduate training. More direct aid to the University is essential.
4. There is a great need to establish research professorships in dental schools. The National Research Council's Associateships, recently approved, are an important step in this direction.
5. More clinical research, and more clinical teachers with training in research methods are required. The hospitals should play an important role in this area.
6. More programs should be initiated within schools to stimulate Faculty interest in research, and to improve interest in scholarly pursuits.
7. There is a need for a quicker implementation of findings in literature to the teaching and practice area.
8. Summer undergraduate research studentships should be continued and, if necessary, expanded.